Chapter 6

Development of a Tutoring System

Introduction

In the following sections, the brief introduction to tutor for the transfer of property, technology used i.e. HTML is discussed. In the subsequent sections implementation and tutor as a help for common man is discussed. Finally the case study example is discussed.

Introduction to Tutoring systems

Intelligent Tutoring Systems have an interesting history, originating in the Artificial Intelligence (AI) movement of the late 1950's and early 1960's. Then, workers such as Alan Turing, Marvin Minsky, John McCarthy and Allen Newell thought that computers that could "think" as humans do were just around the corner. Many thought that the main constraint on this goal was the creation of faster and bigger computers. It seemed reasonable to assume that, once we created machines that could think, they could perform any task we associate with human thought, such as instruction [62].

In the 1960's, researchers created a number of Computer Assisted Instructional (CAI) systems that were generative. These systems did not explicitly address the issues of how people learn, with an implicit behaviorist / transmission model of teaching and learning.
They assumed that, if systems presented information to the learner, the learner would absorb it [63]. A key difference between many intelligent tutors and more traditional CAI systems is that in the ITS the relevant solutions against which to compare the student’s input do not need to be predefined by a human author. These solutions are generated in real-time by the Intelligent Tutoring Systems itself, given the problem definition and the knowledge in the domain model. The comparison between the student’s and the computer’s solution(s) is used to both update the Intelligent Tutoring Systems belief regarding the student’s relevant domain knowledge and skills (i.e., its student model), and to generate an adequate tutorial action (e.g., help with an incorrect solution step, praise for a correct solution). An important class of intelligent tutors that includes rule-based cognitive models belong to that domain expertise [64]. This research work includes traditional expert systems (built to solve problems, not to teach) and produce "value added" instruction for the encoded expertise.

**Tutor for Transfer of property act**

A web-based tutor for the transfer of property act is developed with an aim that it can serve as information service portal. This tutoring system is part of expert system. The goal is to give updated information related to transfer of property a domain which is used by everyone to buy / sell immovable property. There are many issues in the transfer of property act which are outside the scope of knowledge boundary of common man. All these issues are put forth in the tutor so that a common man who intends to buy / sell an immovable property can take the advantage of the tutor to get the relevant information. It has FAQ along with important link to web sites where he can also get information. It gives the buying and selling process along with documents required to buy or sell the property. Hence, this tutor will be of great help for the common man where many the queries can be answered.

**Implementation of Tutor**

The implementation of the tutor was done in discussion with the practising lawyers to understand the practical aspects of the problems in transfer of property act and knowing about the information which is sought by the common man when buying or selling the property in India. With these two goals the tutoring system for the transfer of property act is developed. The discussions were held with the common man who buys and sells the
properties frequently, noted their point of view and also understood their expectation of the tutoring system.

Once the goals were known, the layout was finalised and collection of information from different sources was done. The collection of information was done from the practising lawyers, from the common man and also from the internet websites. The data collection process was done and then it was decided to select the platform for implementation. Author has used html for coding.

About HTML

Hypertext Mark-up Language (HTML) is the main mark-up language for displaying web pages and other information that can be displayed in a web browser. HTML is written in the form of HTML elements consisting of tags enclosed in angle brackets (like <html>), within the web page content. HTML tags most commonly come in pairs like <h1> and </h1>, although some tags, known as empty elements, are unpaired, for example <img>. The first tag in a pair is the start tag, the second tag is the end tag (they are also called opening tags and closing tags). In between these tags web designers can add text, tags, comments and other types of text-based content.

The purpose of a web browser is to read HTML documents and compose them into visible or audible web pages. The browser does not display the HTML tags, but uses the tags to interpret the content of the page. HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. It can embed scripts in languages such as JavaScript which affect the behaviour of HTML webpage’s. Web browsers can also refer to Cascading Style Sheets (CSS) to define the appearance and layout of text and other material. The W3C, maintainer of both the HTML and the CSS standards, encourages the use of CSS over explicitly presentational HTML markup [65].

Tutor – A help to common man

Web-based information displays many benefits of multimedia technology. Using today's fast broadband connections, it is possible to stream sophisticated content to a computer anywhere in the world. This is an advantage for many people as the information can be received and read wherever and whenever it is convenient for them, which can be a crucial
factor for a buying and selling of property transactions. A significant amount of interactive multimedia content is now delivered via the internet.

Web information system, or web-based information system, is an information system that uses Internet web technologies to deliver information and services, to users or other information systems/applications. It is a software system whose main purpose is to publish and maintain data by using hypertext-based principles. A web information system usually consists of one or more web applications, specific functionality-oriented components, together with information components and other non-web components. Web browser is typically used as front-end whereas database as back-end [66].

Figure 6.1 Web-based Tutoring System

Case Study Example:

Computerization and Information technology have played a major role in improving the quality and delivery of justice. But the use of information technology especially in India is confined to indirectly bolstering the speed of delivery of service by providing faster access to information. Thus, IT at best is providing accessory services while the core decision making or judgment is still taken by trained humans. Considering the complex and non-programmed nature of cases which makes each case unique, the human element will continue to play the decisive role in case of judgments. Although, cases can be broken
down into small modules, but successful resolution of each module may not result in a correct resolution of the whole case. As judges, the case should be considered as a whole, while making decisions. Thus, similar small modules may have different results in perspective of the whole case. An IT technique that may assist in comparing whole case and able to group similar cases may provide better advises. But it seems that at present IT shall continue to play an Advisory role leaving the Decisions to judges. In our discussions of court technologies we should always remind ourselves the wise words from Chief Justice Carsten Smith, Supreme Court of Norway, presented at a conference in Singapore in 1996: “We must never forget that the main element in the judicial process is the human element--combined with the touch of the heart--to balance conflicting interests." [67].

As a case study the author has considered Implementation of ICT in Indian Legal domain [68].

Indian Judiciary has played a major role for Nation building and also contributed in mobilizing the society to deliver its best to the Nation. As on date, Litigations have risen in large numbers, thereby making it extremely difficult to manage it manually. It has therefore become essential to improve productivity of the judicial staff for efficiently disposing and following up cases registered with various Courts. A thought to provide ICT based Judicial Services to the Judges, Advocates/Lawyers and Citizen had become the need of the hour. It was decided to use new technology at marginal cost to achieve the final goal of catalyzing the judicial service to be provided to common man and at the same time concentrate on the internal Judicial Administration to monitor closely the issue of growing Pendency.

The main objective of developing this application is to
1. Provide all back office activities of the Judiciary online.
2. Facilitate Judicial Management to track the critical issue of Pendency.
3. Provide online interface for the Citizens/Advocates to query the system.

Computerisation in the Judiciary of Maharashtra state was taken up in early 1997 on Linux 2.0.30 and ‘C’ Language. The software catered to basic needs of judiciary but due to limitations of technology available, it could not be enlarged. Keeping in view the growing needs of the Judiciary, it was necessary to migrate from legacy system to new full-featured system.

It was decided to complete the computerization in all the Courts of Maharashtra and National Informatics Centre Pune was entrusted to Understand the Requirements, Design,
Development and Implementation of the Software on a pilot basis at District & Sessions Court Pune.

**Scope:** Application is designed to provide Citizen Interfaces like Touch Screen Kiosk, Display Screen, Interactive Voice Response System, internet based dissemination for the common man and Lawyer. For the Judiciary, monitoring the critical issue of Pendency, fast and accurate information retrieval and ease in entering the relevant data was considered as focal point to be addressed while understanding the requirements. The decision makers were to be provided with full-featured facility through which the information required by them can manage several factors ranging from mobilizing Human Resources to assessment of the officers and also redressal of specific grievance was to be incorporated in the application.

**Implementation:** The application is implemented in District Court Pune and at Small Causes Court Mumbai. Data is already ported from legacy system to the new system. At Pune, almost 26,500 cases (records) with 4,05,000 proceedings (records) is ported from the legacy system to the new system. Fresh data entry of Lower courts comprising of almost 1,40,000 Cases is completed and all the lower courts are online. Four Taluka Courts are also computerized and the data entry is also completed. Baramati is the first Taluka Court to be computerized in India. It was inaugurated at the hands of Hon. Chief Justice Maharashtra ON 8TH August 2004. Training for system administration was imparted to 4 users from the district court who are responsible for handling the system administration. Software usage training is imparted to 150 employees and they are now put on the job. The application has been implemented and the cases are accepted through the Filing Counter. PCs are installed in the courtrooms and the bench clerk carries out live entry of proceedings. Data is now updated in real time. Touch Screen Kiosk is installed in the court premises for Lawyers and Litigants. The application has become operational from 1st September 2003 in the District and Sessions Court Pune and from 1st December 2003 in Small Cause Court Mumbai and has satisfied with 99% uptime.

**Impact on Society (G2C):** An Example from District Court Pune

Stakeholders in the Judicial functioning are mainly Lawyers, Litigants and some portion of society related to cases pending in the court. The statistical analysis in District & Sessions Court Pune as on date shows that around 1,66,982 cases involving almost 3,33,964 (Petitioners/Respondents) individuals or organizations as main Litigants and 1,50,000 as extra parties totaling to 4,83,964 are the direct beneficiaries of application in the District &
Sessions Court Pune (Data excludes Taluka Courts). Apart from this, 6000 Advocates/Lawyers are users of the system.

**Impact on Judiciary (G2G):** An Example from District Court Pune

Judicial Administration is bound by the stringent procedures of Law. Civil Manual and Criminal Manual provides the guidelines to be followed. In Pune District Court 90 Judges (27 from appellate and 63 from Lower Courts) and 200 employees contribute in day-to-day functioning. The work flow is managed by Case Information System by providing 270 features that includes necessary input screens, reports, queries etc. needed by the administrators for quick and efficient disposal of various activities of the court. Through these features it has become easier for the Court Staff to handle the routine work and speed up their functioning. It is ensured that work allotted to the employee is carried out at the expected time. The tedious task of searching the records to resolve various queries manually which required considerable time, is completely eliminated. The compliance on High Court queries is fulfilled in shortest time through the system. Most of the reminders and alerts on occurrence of certain function is automated.

**Technical Innovation:**

The main technical factor was to use open source technology to develop and implement the application. LAMP (Linux-OS, Apache-Web Server, MySQL-RDBMS, PHP-Scripting Language) was finalized after assessment of several other open source software. The software scalability and adoptability had necessitated its development to be three tier web based. The development commenced by keeping in view the Quality Assurance requirements and complete QA process was adopted while designing and developing the application. Reports are generated in PDF formats, the binaries for generating the same was also provided on open source platform. QA process has considerably reduced the time required to test the application once it was ready. This application provides maintaining log of all Audit Trails.

In some of the courts of Maharashtra since the legacy application (Terminal based DCIS developed in ‘C’) was in place, and most of the data pertaining to the new requirements was available it was necessary to ensure that the data can be ported from legacy system to the new system. Separate application for seamless migration was also developed and made available as a part of the Case Information system (CIS).

**Local Language Support:**

Application provides local language support through the use of UNICODE. Search on Unicode based text is also available.
Most Economic Model:
The application is completely on Open Source Platform. Currently 1 Server and 63 Clients are in place. Every Court Room is provided with 1 Client and 1 Printer. Clients are also provided on Filing Counter and various sections. Touch Screen Kiosk is provided for public dissemination of information.

Sustainability of the Project:
The application has been developed for the district court which would be managed entirely by the internal staff of the courts. NIC is providing all technical support to ensure smooth functioning over time.

Replication in Other Courts:
The Case Information System is accepted by Maharashtra Judiciary. Implementation of CIS is successfully completed at all the 365 locations of Maharashtra. The use of Open Source Technology have saved huge amount (around 17.5 Crores) to the exchequer.